

APPLICATION FOR AN INDIVIDUAL INCIDENTAL  
TAKE PERMIT UNDER THE ENDANGERED  
SPECIES ACT OF 1973

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BY

NORTH CAROLINA DIVISION OF MARINE  
FISHERIES  
PO BOX 769  
MOREHEAD CITY, NORTH CAROLINA 28557

252-726-7021

## INTRODUCTION

The North Carolina Division of Marine Fisheries (NCDMF) requests an Individual Incidental Take Permit (ITP) under Section 10 of the Endangered Species Act of 1973 authorizing implementation of management measures during the fall of 2001 to protect threatened and endangered sea turtles while allowing gillnet fisheries for flounder and other species to be prosecuted in designated areas within the Pamlico Sound. This request is similar to that of July 2000, which resulted in the National Marine Fisheries Service (NMFS) issuing an ITP for the 2000 fall gillnet fishery for southern flounder in southeastern Pamlico Sound. Shallow water fisheries along the Outer Banks will be managed and monitored by NCDMF. NMFS has indicated that they intend to close adjacent deep water fishing areas to large mesh gillnets during the 2001 season.

In November 1999, significant increases were noted in sea turtle strandings in the southeastern portion of Pamlico Sound (Sea Turtle Stranding Report Zone 35, Inshore). During November and December, a total of 97 strandings occurred in the area. At-sea monitoring was conducted aboard gillnet vessels by NCDMF in southeastern Pamlico Sound during November 22-24, 1999. Eleven observer trips were conducted, consisting of five trips aboard deep water flounder gillnet (> 5-inch stretched mesh) vessels and six trips aboard shallow water spotted seatrout gillnet (3 to 5-inch stretched mesh) vessels. Two sea turtle takes were observed in the deep water fishery while no takes were observed in shallow water fishery. Although data were insufficient to detect differences between shallow and deep water takes, the information suggested that the deep water, large mesh gillnet fishery for flounder in southeastern Pamlico Sound may have been responsible for a significant portion of the strandings.

On December 10, 1999, NMFS issued an emergency rule closing southeastern Pamlico Sound to gillnets larger than five-inch mesh to protect endangered and threatened sea turtles (NMFS, 1999), the closure remained in effect through January 9, 2000.

In July 2000, the NCDMF applied for an ITP authorizing the implementation of management measures to protect threatened and endangered sea turtles in the southeastern Pamlico Sound fall flounder gillnet fishery. Incidental Take Permit Number 1259 was issued by the National Marine Fisheries Service (NMFS) on October 5, 2000 and signed by NCDMF on October 24, 2000. The ITP expired December 16, 2000. Observed levels of sea turtle interactions with gillnets and sea turtle strandings had reached thresholds specified in the ITP for closure of the large mesh (> 5-inch stretched mesh) gillnet fishery at the time of the signing of the ITP by NCDMF. As a result of the thresholds being reached, NCDMF issued Proclamation M-14-2000 closing the southeastern Pamlico Sound Gill Net Restricted Area (PSGNRA) to the use of large mesh gillnets effective October 27, 2000.

From September 15 through December 15, 2000, a total of 79 strandings occurred (28 green turtles, 25 loggerheads and 26 Kemp's ridleys) within the PSGNRA. This total excludes all live, cold-stunned turtles. Twenty strandings occurred in the PSGNRA during the September 15 and October 27, 2000 open season. Fifty-nine strandings occurred in the PSGNRA after the October 27 closure. Twenty-four of these strandings occurred prior to the first major temperature drop of the fall, which occurred around November 18. Of the remaining 35 strandings, which occurred between November 18 and December 15, it is likely that a portion died from sudden exposure to cold temperatures.

It is the intent of NCDMF to implement management measures for gillnet fisheries in five designated shallow water areas of Pamlico Sound during the fall of 2001. Shallow water fisheries along the Outer Banks will be managed and monitored by NCDMF with the understanding that NMFS will close adjacent deep water fishing areas to large mesh gillnets. These measures are expected to significantly reduce the number of sea turtle interactions with gillnets from observed levels for September 15 - October 27, 2000.

## **SPECIES**

loggerhead turtle (*Caretta caretta*)

green turtle (*Chelonia mydas*)

leatherback turtle (*Dermochelys coriacea*)

hawksbill turtle (*Eretmochelys imbricata*)

Kemp's ridley turtle (*Lepidochelys kempii*)

The leatherback and hawksbill were listed as endangered throughout their ranges on June 2, 1970 under the Endangered Species Act of 1973 (Public Law 93-205). The Kemp's ridley was listed as endangered on December 2, 1970. The green turtle was listed as threatened on July 28, 1978, except for the breeding populations of Florida and the Pacific coast of Mexico, which were listed as endangered. The loggerhead was listed as threatened wherever it occurs on July 28, 1978.

The geographic distribution of the loggerhead includes the subtropical (and occasionally tropical) waters and continental shelves and estuaries along the margins of the Atlantic, Pacific, and Indian oceans. It is rare or absent far from mainland shores. In the Western Hemisphere, it ranges as far north as Newfoundland and as far south as

Argentina.

The green turtle has a circumglobal distribution in tropical and subtropical waters. In U.S. Atlantic waters, it occurs around the Virgin Islands and Puerto Rico and from Texas to Massachusetts.

The leatherback occupies the open seas, although it is occasionally seen in coastal waters. Although it prefers warmer waters, it frequently appears in New England waters and north to Newfoundland during the summer months.

The hawksbill is typically a tropical species found throughout the Caribbean. They are commonly observed in the Florida Keys, the Bahamas, and southwestern Gulf of Mexico. Stragglers have been reported as far north as Massachusetts and as far south as northern Argentina. It is infrequently found in shallow coastal systems.

Most Kemp's ridleys occur in the Gulf of Mexico, but they also occur along the Atlantic coast as far north as Long Island and Vineyard South, Massachusetts.

Public sightings of sea turtles in the Atlantic Ocean off North Carolina during 1989 - 1992 occurred throughout the year (Epperly et al., 1995). Two techniques employed to obtain public sighting data were: utilization of the Marine Recreational Fishery Statistics Survey (MRFSS) and voluntary reporting by the public. In addition to reports of free-swimming animals, public sighting reports included incidental capture by shrimp trawls, fish trawls, pound nets, gillnets, channel nets, and hook and line gear. Most were sighted in May and June (1133 turtles), with much fewer in other months: July and August (406), September and October (358), March and April (246), November and December (169), and January and February (76). Most sightings were from Cape Lookout to the north along the Outer Banks. Below Cape Lookout, sea

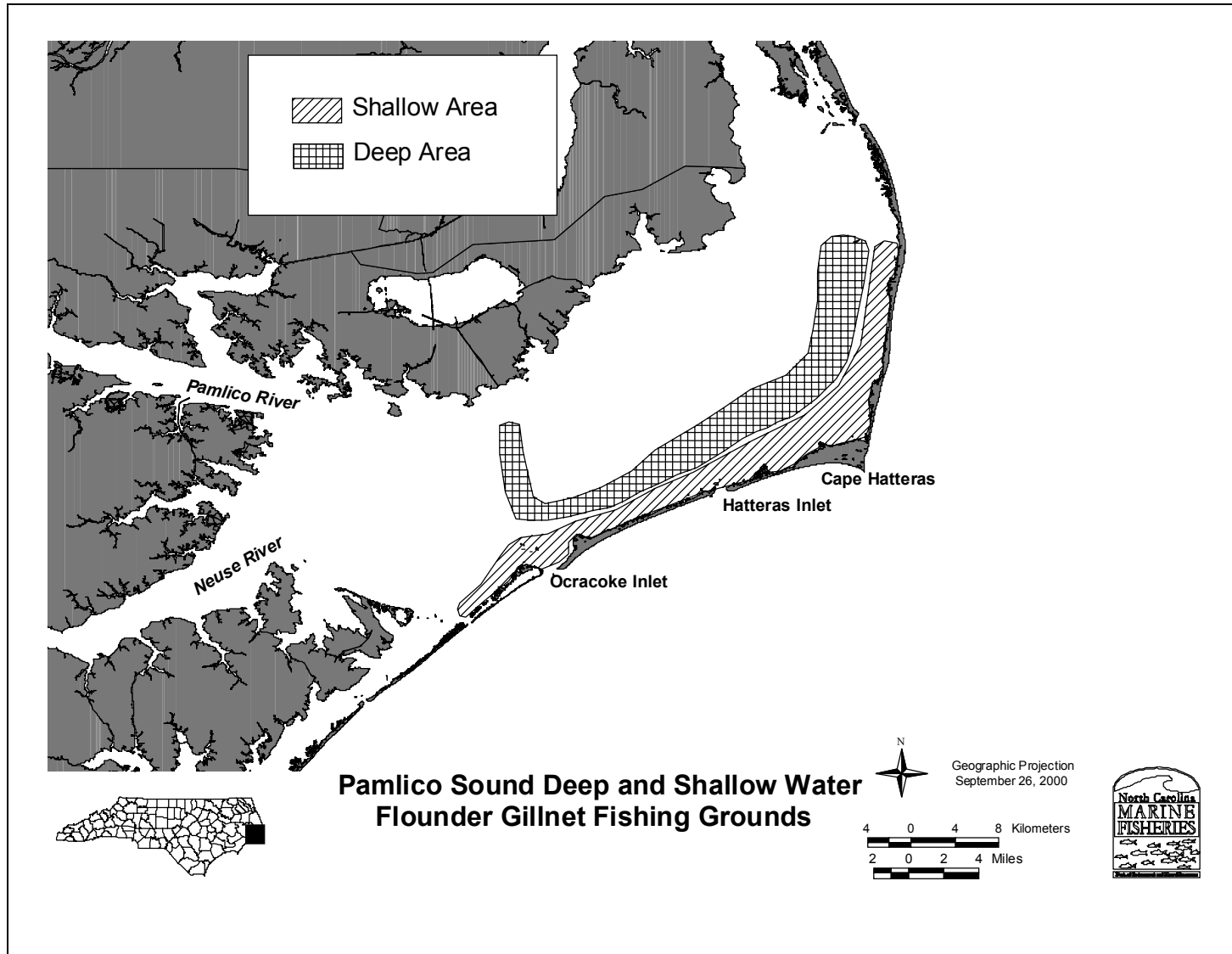
turtles were relatively common off Onslow County. During the four-year period of 1989-1992, recreational fishermen sighted turtles in nearshore ocean waters on 6.5% of their trips, as compared to 2.6% for trips that covered both inshore and offshore waters.

Sea turtle strandings in North Carolina have been increasing since 1995, the first year that the number of strandings in the state exceeded 300 individuals. Prior to 1995, annual stranding totals averaged less than 200. Strandings reached their highest level in 2000 with a statewide total of 838.

Females of all five species of sea turtles lay clutches of eggs in nests on coastal beaches. The adults aggregate off the nesting beaches during the spring to mate and females may lay up to seven clutches during a single nesting season. After an incubation period of two months, the hatchlings dig their way to the surface and scramble to the ocean. They swim offshore and spend their early life in the offshore waters. After a few years, most species enter the coastal waters or move into bays, river mouths, and estuaries where they spend their juvenile life. There appears to be an inshore movement as the waters warm in the spring and an offshore movement as the waters cool in the late fall and early winter (Epperly et al., 1995).

## **FISHING GEAR AND AREA**

Monitoring conducted by NCDMF during the 2000 fishing season indicates that the Pamlico Sound flounder gillnet fishery consists of two major components: a shallow water fishery, which occurs along the Outer Banks; and a deep water fishery that operates further from shore along a slope adjoining the main basin of Pamlico Sound (Figure 1).



**Figure 1.** North Carolina flounder gillnet fishing grounds in Southeastern Pamlico Sound.

The shallow water fishery operates from April through December in areas next to the barrier islands in Pamlico Sound. Fishing depths are typically less than three feet. Vessels are usually open skiffs ranging from 15 to 25 feet in length. Each fisherman sets 500 to 2000 yards of large mesh (5.5- to 7.0- inch) gillnet, which are soaked overnight and retrieved by hand. Monitoring during the 2000 fishing season consisted of 4.3% coverage of this fishery with 37 trips observed. Four sea turtle interactions were observed and all were green turtles, three were released alive.

The deep water fishery operates from September through December with fishermen setting nets along a slope just outside of the shallow water fishing areas (Figure 1). Fishing depths range from 10 to 20 feet. Vessels are typical ocean sink gillnet boats ranging from 25 to 45 feet in length. Each vessel sets 2,000 to 5,000 yards of large mesh (5.5- to 6.5- inch) gillnet, which are soaked up to three days and retrieved with the aid of net reels. Monitoring during the 2000 fishing season consisted of 13.1 % coverage of this fishery with 35 trips observed. Fourteen sea turtle interactions were observed including four Kemp's ridley, two green, and eight loggerheads. Eight of these turtles were released alive.

## **PROPOSED ACTIVITY**

The shallow water fisheries along the Outer Banks will be managed and monitored by NCDMF with the understanding that NMFS will close adjacent deep water fishing areas to large mesh gillnets. The primary purpose of the ITP for 2001 will be the protection of sea turtles through the implementation of management measures directed at the use of all gillnets used in shallow water areas of southeastern Pamlico Sound along the Outer Banks. Trawl fisheries for shrimp and blue crabs and pound net



fisheries for flounder occur in other parts of Pamlico Sound during the fall but these fisheries are not suspected of contributing to sea turtle strandings that occurred during the fall of 1999 or 2000.

## **LANDINGS AND VALUES**

The North Carolina Trip Ticket Program requires that commercial fishermen report landings by water body and gear. There are no subdivisions for the Pamlico Sound water body, and gillnet landings are not reported by mesh size. Flounder landings by large mesh gillnets in southeastern Pamlico Sound cannot be separated from flounder landings by other gillnets set in the area. Flounder landings may be identified by gear and by month for the Pamlico Sound. Monthly landings values are not available from the trip ticket data, these values are derived from annual values. Historically, the majority of the flounder landings by float and sink gillnets from Pamlico Sound occurred from September through December. It may be assumed that these landings are predominantly from the large mesh fishery because the minimum size limit for flounder in state estuarine waters is 13 inches. In 1998, flounder landings from the Pamlico Sound fall gillnet fishery totaled 714,879 pounds valued at \$1,321,505 while landings in 1999 were 621,518 pounds valued at \$1,069,967. In 2000, flounder landings were 678,189 pounds valued at \$802,847.

## **MANAGEMENT MEASURES**

The NCDMF proposes the implementation of several management measures for Pamlico Sound shallow water gillnet fisheries during the fall of 2001 to minimize interactions between threatened and endangered sea turtles and gillnet gear. Shallow water fisheries along the Outer Banks will be managed by NCDMF with the

understanding that NMFS will close adjacent deep water fishing areas. The following management measures will be implemented for Pamlico Sound gillnet fisheries:

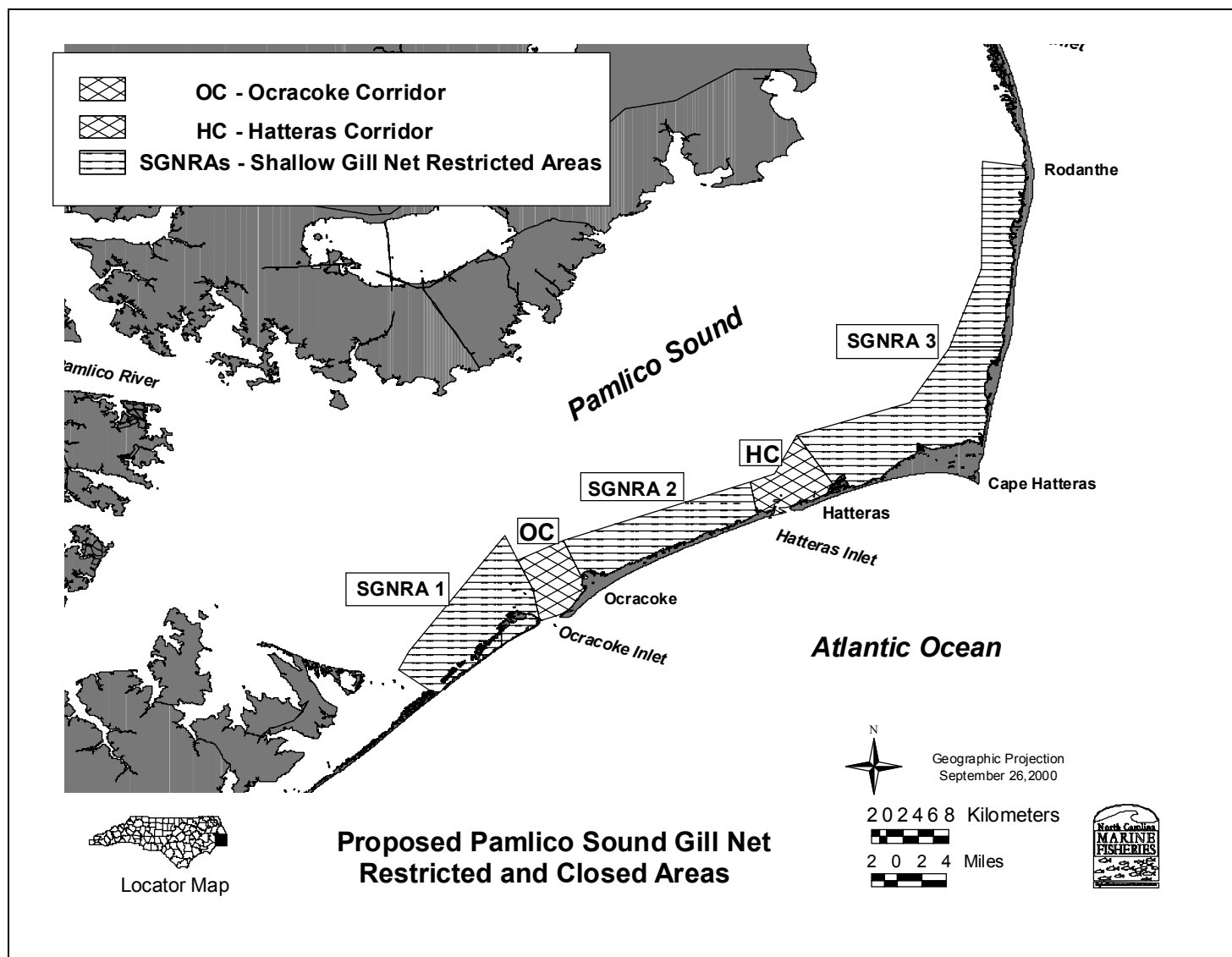
1. NCDMF will designate five gillnet restricted areas (GNRAs) in Pamlico Sound. All restricted areas will be in shallow water fishing areas and each region will have individual time/area gillnet restrictions. The five areas will consist of three Shallow Water Gillnet Restricted Areas (SGNRA1, SGNRA2, and SGNRA3), an Ocracoke Inlet Corridor (OC) and a Hatteras Inlet Corridor (HC) (Figure 2).
2. From September 15 through October 31, 2001 small mesh gillnets (< 5-inch stretched mesh) must be attended (within 100 yards at all times) within all five GNRAs.
3. From September 15 through December 15, 2001, the OC and HC areas will be closed to large mesh gillnets ( $\geq$  5 -inch stretched mesh). Small mesh gillnets allowed in the OC and HC will be restricted to 2,000 yards per fishing operation (Figure 2 and Table 1).
4. Individual fishing operations that set gillnets in more than one of the GNRAs will be restricted to 2,000 yards per fishing operation.
5. Individual fishing operations employing gillnets will be required to obtain an NCDMF issued permit to fish in any of the GNRAs between September 15 and December 15, 2001.
6. Provisions of the GNRA permit establish mandatory observer coverage and weekly reporting requirements as specified under the MONITORING section of this application.

7. Fishermen will be required to report gillnet interactions with sea turtles in GNRAs to the NCDMF Communication Center in Morehead City, NC as soon as possible after discovery of an interaction.
8. Fishermen will be required to bring all incidentally captured Kemp's ridley carcasses ashore for collection of biological data by NCWRC or NMFS staff. Fishermen will also be authorized to bring in the carcasses of other species if requested to do so by NCDMF.
9. Fishermen will be authorized to bring ashore live, debilitated turtles for examination and/or treatment by NCWRC or NMFS staff.
10. Fishermen will be required to release resuscitated sea turtles outside the GNRAs or transfer resuscitated sea turtles to the NCDMF Marine Patrol or NMFS for observation and release outside the GNRAs.

These and other management measures will be implemented under the authority granted to the Fisheries Director by North Carolina Fisheries Rules for Coastal Waters to issue proclamations for management of specific fisheries or Fisheries Rule 15A NCAC 3I. 0107 (b) which pertains to protection of endangered or threatened species.

## **MANAGEMENT RESPONSES**

Additional, management measures may be implemented in all GNRAs or only in those in which the takes occurred. The level of restrictions will be determined by the actions deemed necessary by NCDMF, in consultation with the NMFS, to reduce takes and may consist of: area closures, gear restrictions, maximum soak times, gear attendance requirements, gillnet permit modifications, increased observer coverage, or combinations of these management measures.



**Figure 2.** Proposed NCDMF Gillnet Restricted Areas for the 2001 gillnet fisheries. SGNRA = Shallow water Gillnet Restricted Area; OC = Ocracoke Inlet Corridor; HC = Hatteras Inlet Corridor.

**Table 1.** Proposed NCDMF 2001 sea turtle conservation measures for Pamlico Sound. Shaded blocks indicate time/area closures for large mesh gillnets ( $\geq 5$  -inch stretched mesh). SGNRAs = Shallow water Gillnet Restricted Area; OC=Ocracoke Inlet Corridor; HC=Hatteras Inlet Corridor.

<b>2001 Pamlico Sound Sea Turtle Conservation Measures</b>			
	<b>SGNRAs</b>	<b>OC</b>	<b>HC</b>
p 15, 2001 thru ct 31, 2001	2,000 Yard Limit Small Mesh Gillnets ( $< 5$ -inch) Attendance Required GNRA Permit Required	2,000 Yard Limit Small Mesh Gillnets ( $< 5$ -inch) Attendance Required GNRA Permit Required	2,000 Yard Limit Small Mesh Gillnets ( $< 5$ -inch) Attendance Required GNRA Permit Required
	2,000 Yard Limit Large Mesh Gillnets ( $\geq 5$ -inch) GNRA Permit Required	Closed Large Mesh Gillnets ( $\geq 5$ -inch)	Closed Large Mesh Gillnets ( $\geq 5$ -inch)
ov 1, 2001 thru c 15, 2001	2,000 Yard Limit Small Mesh Gillnets ( $< 5$ -inch) GNRA Permit Required	2,000 Yard Limit Small Mesh Gillnets ( $< 5$ -inch) GNRA Permit Required	2,000 Yard Limit Small Mesh Gillnets ( $< 5$ -inch) GNRA Permit Required
	2,000 Yard Limit Large Mesh Gillnets ( $\geq 5$ -inch) GNRA Permit Required	Closed Large Mesh Gillnets ( $\geq 5$ -inch)	Closed Large Mesh Gillnets ( $\geq 5$ -inch)
Shaded areas indicate time/area closures to large mesh gillnets ( $\geq 5$ - inch stretched mesh)			

## AUTHORIZED INCIDENTAL TAKES

Pamlico Sound gillnet fisheries will be closed selectively if either estimated gear interactions or mortalities within the GNRAs between September 15 and December 15, exceed the following levels:

**Table 2.** Estimated lethal and live takes, which will require gillnet closures during the 2001 fishing season.

<b>Species</b>	<b>Estimated Lethal Takes</b>	<b>Estimated Live Takes</b>
Kemp's Ridley	24	164
Green	24	164
Loggerhead	24	164
Species Aggregate	72	492

These levels were provided by NMFS and were based on take levels set by NMFS during the 2000 fishing season for large mesh gillnet fisheries in both shallow and deep water (Table 3). The 2000 take levels were intended to represent a 50% reduction in the overall gillnet mortality of turtles in Pamlico Sound when compared to the estimated mortality during the 1999 season. The 2000 take levels assumed a 33% mortality rate for gillnets, which primarily considered deep water large mesh gillnets.

**Table 3.** Estimated lethal and live takes, which required gillnet closures during the 2000 fishing season.

<b>Species</b>	<b>Estimated Lethal Takes</b>	<b>Estimated Live Takes</b>
Kemp's Ridley	96	192
Green	36	72
Loggerhead	56	112
Species Aggregate	175	350

For 2001, NMFS assumes that the overall level of take will remain about the same. The deep water large mesh gillnet fishery will be eliminated by NMFS, but the

shallow water small mesh fishery will be added. Assuming that the shallow water small mesh gillnet fishery has approximately the same amount of fishing effort (yards of gillnet x soak days) as the deep water large mesh gillnet fishery, then the same number of interactions are expected for 2001. During the 2000 season, the deep water large mesh gillnet fishery was the most lethal for sea turtles. Based on differences in average soak times between fisheries, NMFS assumes that the shallow water large mesh gillnet fishery is half as lethal as the deep water large mesh gillnet fishery. Additionally, NMFS assumes that the shallow water small mesh gillnet fishery is half as lethal as the shallow water large mesh gillnet fishery. These assumptions translate to a new assumed mortality rate of 12.5%. When this rate is applied to the total number of authorized turtles takes in the 2000 ITP, which was 493 live takes for all species combined then the number of authorized lethal takes for 2001 is 71. Lacking consistent information on the species composition of sea turtles in Pamlico Sound, NMFS was unable to further break these numbers down into separate take levels for each species so an even three way split was applied among loggerhead, green, and Kemp's ridley sea turtles.

It is the intent of NCDMF to use the provisions of the ITP to manage gillnet fisheries in Pamlico Sound to reduce the threat of this gear to Kemp's ridley, green and loggerhead sea turtles. Although hawksbill and leatherback sea turtles are rare in North Carolina internal waters, it is requested that the ITP also authorize the take of one hawksbill and one leatherback sea turtle. In the event that a capture of either of these species occurs in any of the GNRAs, NCDMF will close the fishery responsible in the GNRA where the take occurs. The inclusion of these two species in the ITP will allow

the application of the management measures implemented for protection of green, Kemp's ridley and loggerhead sea turtles to also apply to hawksbill and leatherback sea turtles.

## **CONSERVATION PLAN**

The NCDMF proposes to use proclamation authority to implement management measures for Pamlico Sound gillnet fisheries during the fall of 2001 to minimize sea turtles interactions with gillnets and prevent estimated mortalities from exceeding levels specified in the AUTHORIZED INCIDENTAL TAKES section of this application. If interactions or extrapolated mortality levels exceed these thresholds, the NCDMF will selectively close fisheries to reduce interactions between sea turtles and commercial fishing gear. Existing proclamation authority allows the Fisheries Director to specify area, season, mesh size, means/methods, number and length for gillnets. North Carolina General Statutes specify that proclamations that are issued for management of fisheries must be issued with a minimum of 48 hours advanced public notice.

The NCDMF will issue a proclamation specifying management measures for the fall gillnet fisheries in Pamlico Sound GNRA's during September 2001. The proclamation will close the OC and HC areas to large mesh ( $\geq 5$  -inch stretched mesh) gillnets from September 15 through December 15, 2001. Small mesh ( $< 5$  - inch stretched mesh) gillnets will be allowed in the OC and HC but will be limited to a maximum of 2,000 yards per fishing operation. The proclamation will also restrict the use of all gillnets in the SGNRAs, to a maximum of 2,000 yards per fishing operation from September 15 through December 15, 2001. The proclamation will also require attendance of all small mesh gillnets in all GNRAs from September 15 through October



31, 2001. In addition, the proclamation will require fishermen to obtain a permit from NCDMF for participation in Pamlico Sound gillnet fisheries between September 15 and December 15, 2001. Fishermen will also be required to report all sea turtle/gillnet interactions to the NCDMF Communications Center by marine radio or telephone or to a NCDMF Marine Patrol officer as soon as possible after discovery of an interaction. Gillnet permits will be used to identify fishermen authorized to fish gillnets in the area during the fall and as a means of monitoring fishing activity in the area. A permit must be obtained before beginning a gillnet operation in GNRAs between September 15 and December 15, 2001. The permit will specify conditions for participation in gillnet fisheries such as the requirement to report gear interactions with sea turtles and the requirement to allow observers onboard. Additional management measures may include time, area and gear restrictions or the closure of fisheries if observed sea turtle gear interactions or extrapolated mortalities exceed thresholds specified in the AUTHORIZED INCIDENTAL TAKES section of this application. The permit and proclamation(s) will inform fishermen of the requirements for participation in fall gillnet fisheries in the GNRAs and will serve as the primary means of ensuring compliance with the provisions of the ITP.

## **FUNDING**

The NCDMF will institute and fund all of the provisions and actions required by the Incidental Take Permit, except observer coverage. Funds are not available within NCDMF to allow for an observer program designed to produce 20 percent coverage of Pamlico Sound shallow water gillnet fisheries during the fall of 2001. The NCDMF requests that NMFS assist with the cost of observers for monitoring the fall gillnet

fisheries in the GNRAs. Should outside funds be unavailable for an observer program for all fall gillnet fisheries, NCDMF will be unable to conduct a meaningful observer program.

### **STEPS PROPOSED TO MONITOR AND MINIMIZE IMPACTS**

The impacts of gillnet fisheries in the GNRAs will be monitored through permits, gear interaction reporting requirements, onboard observers and surveillance by NCDMF Marine Patrol. Gear impacts will be minimized through the implementation and enforcement of management measures specified under proposed activity.

Sea turtles are recognized as either threatened or endangered under North Carolina State law and implementing regulations. The State of North Carolina has entered into cooperative agreements with the U.S. Fish and Wildlife Service and NMFS concerning regulatory jurisdiction over endangered or threatened species, to include sea turtles. Marine Patrol officers of the Division of Marine Fisheries have jurisdiction to enforce State laws and rules related to endangered and threatened species in coastal waters. The Fisheries Director has authority to close or restrict by proclamation any coastal waters with respect to taking or attempting to take any or all kinds of marine resources when the method (equipment) used is a serious threat to an endangered or threatened species pursuant to 16 USC 1533(c). Additionally, the Fisheries Director has proclamation authority to restrict various types of fishing gear.

### **MONITORING**

Gear interaction mortalities will be monitored through reports from fishery observers, gear interaction reports from fishermen, and NCDMF Marine Patrol surveillance and violations of proclamation restrictions or permit conditions. When

authorized by the NCDMF, fishermen will be required to bring sea turtles carcasses to shore for necropsies by trained NCWRC or NMFS personnel.

Sea turtles strandings will be monitored through the North Carolina Wildlife Resources Commission Stranding Network. Additionally, interaction monitoring will be conducted as a component of NCDMF gear research activities described in the GEAR TESTING section of this application.

### **SEA TURTLE BYCATCH MONITORING PROGRAM**

Fishermen that use gillnets in the GNRAs during the times specified in each region will be required to obtain a state GNRA permit. A provision of the permit will establish mandatory observer coverage and weekly reporting requirements. The following information will be provided each week by each fishermen for each permitted gillnet fishing trip within the GNRAs.

- Pounds of flounder landed
- Yards of gillnet set
- Soak time for each trip (days)
- Restricted Area fished
- Number of sea turtles caught
- The condition of any sea turtles caught.

Reports must be submitted to NCDMF by 6 pm on Sunday during each week of the fishing season. Failure to comply with these reporting requirements or providing false information may result in permit revocation. In addition, fishermen will be required to report all sea turtle interactions to NCDMF within 24 hours.

The GNRA permit also establishes mandatory observer coverage. Permit holders will be required to allow NCDMF or NMFS fishery observers aboard their vessels to monitor catches. Failure to comply with this permit provision will result in permit revocation. A list of all permit holders will be utilized to randomly assign observers to vessels by fishery (large or small mesh) and port. Ports will include Rodanthe, Avon, Buxton, Hatteras, Ocracoke and Cedar Island. Observer coverage will be proportionally allocated based on the 1999 trip distribution among these ports and fisheries. A minimum of 10 percent coverage will be achieved for each fishery through October 31, 2001. From November 1, through December 15, 2001, a minimum of 20 percent coverage will be achieved for each fishery. Based on 1999 NC Trip Ticket data, this level of coverage will require approximately 400 observed trips for both fisheries combined.

Each observer will be trained to identify, measure, and resuscitate sea turtles. Date, time, location (latitude and longitude, when possible) of each turtle taken, condition (e.g., no apparent harm, injury including a description of the nature of the injury, or mortality), species, sex (if determinable), straight carapace length, and disposition will be recorded. All incidentally captured Kemp's ridley carcasses and carcasses of other species will be brought to shore when feasible. All live debilitated sea turtles will be brought to shore for examination and treatment. Carcasses not brought in for post-mortem examination will be marked either with external flipper tags or spray painted prior to disposal overboard.

All data on gear parameters, finfish catch and bycatch will also be collected. Data will be coded on NCDMF data sheets for gillnet fishery observers and key entered

by NCDMF staff. NCDMF staff will debrief each observer within 24 hours of each trip to collect information on catch, set locations, gear, and sea turtle interactions.

The total bycatch of sea turtles in the deep and shallow water fisheries will be estimated using the delta-lognormal method (Pennington 1983). This method provides minimum variance unbiased (MVU) estimators of means and variances for sampling data that contain many zero observations (NMFS 2001). The bycatch estimate will be constructed as a product of the proportion of positive sets and the average bycatch rate of the positive sets. The bycatch rate will be estimated from the number of sea turtles caught per unit of fishing effort where fishing effort is yards of gillnet x soak days. Total fishing effort will be taken from weekly fishermen reports. NCDMF staff will consult with NMFS NEFSC staff on this analysis as needed. Estimates will be calculated weekly and reports will be provided to the NMFS SERO, Protected Species Branch. In addition, monthly summaries and a detailed final report will also be provided.

## **GEAR TESTING**

Two modified gillnets will be tested against a traditionally designed control net. The traditional flounder gillnet will be ten feet deep and the float and leadlines will be tied together with three foot tie-downs. The experimental nets will consist of a low profile standard net and a double lead line net. The low profile net will be five feet deep and will not have tie-downs. The double leadline net will have the same specifications as the control net with the exception of the floatline being replaced by another leadline.

The study will be conducted in southeastern Pamlico Sound between September 15 and December 15, 2001. Sample sites will be chosen along the outer banks in traditional commercial deep-water flounder gillnet fishing areas. Nets will be set

overnight and samples will be collected daily or as often as weather permits during the fishing season. A commercial vessel will be contracted to set and retrieve nets.

Net design: Three types of gillnets will be constructed for this study (Table 4). Each gillnet will be 100 yards long with three nets per string. Each string will be composed of one net design. Each replicate will consist of three strings of each net design. Three replicates (total of 27 nets) will be constructed.

- i) The standard net will be constructed of 6 ½ -inch monofilament webbing with a diameter of 0.57 mm, twenty-five meshes deep. The floatline will consist of 50 fathoms of three-eighths twisted poly float line with one deepwater gillnet float every two fathoms, or twenty-five per net. The leadline will be 50 fathoms of 65-lb/100 fathom leadline. Tie-downs will be added to this net with one 3 foot tie-down every four fathoms, or twelve per net.
- ii) The low profile net will be constructed of 6 ½ -inch monofilament webbing with a diameter of 0.57 mm, twelve meshes deep. The floatline will consist of 50 fathoms of three-eighths twisted poly float line with no additional floatation added. The leadline will be 50 fathoms of 65-lb/100 fathom leadline.
- iii) The dual leadline net will be constructed of 6 ½ -inch monofilament webbing with a diameter of 0.57 mm, twenty-five meshes deep. The floatline will be replaced by a leadline and the leadlines will consist of 50 fathoms each of 65-lb/100 fathom leadline.

**Table 4.** Net characteristics of the three types of gillnets to be built and tested.

<b>NET CHARACTERISTICS</b>	<b>Standard</b>	<b>Low Profile</b>	<b>Dual Leadline</b>
<b>Webbing</b>			
Mesh size (stretched inches)	6 ½	6 ½	6 ½
Material	Monofilament	Monofilament	Monofilament
Twine diameter (mm)	0.57	0.57	0.57
Mesh depth	25	8	25
<b>Floatline</b>	300 feet 3/8 in. poly with one gillnet float per 2 fathoms	300 feet 3/8 in. poly with no additional floatation	300 feet 65 lb/100 fathom leadline
<b>Leadline (feet)</b>	300 feet of 65 lb/100 fathom	300 feet of 65 lb/100 fathom	300 feet of 65 lb/100 fathom
<b>Tie-Down</b>	one 3 feet per 4 fathoms	None	None
<b>Overall Length per net (feet)</b>	300	300	300

All operational and environmental data will be recorded on a set-by-set basis. Species composition and weights of each catch will be recorded. Lengths of flounder and other key species will also be recorded. Catch and bycatch per soak hour will be compared among nets. Length frequency distributions will also be compared among nets. These comparisons will be conducted for flounder and other key species and species groups.

Each observer will be trained to identify, measure, and resuscitate sea turtles. Date, time, location (latitude and longitude, when possible) of each turtle taken, condition (e.g., no apparent harm, injury including a description of the nature of the injury, or mortality), species, sex (if determinable), straight carapace length, and disposition will be recorded. All incidentally captured Kemp's ridley carcasses and carcasses of other species will be brought to shore when feasible. All live debilitated sea turtles will be brought to shore for examination and treatment. Carcasses not

brought in for post-mortem examination will be marked either with external flipper tags or spray painted prior to disposal overboard.

Sea turtle interactions are expected to be minimal due to the small amount of traditional gear used (900 yards) in this study. Based on 2000 observer data, the mean sea turtle catch rate in the deep water large mesh gillnet fishery was 0.16 turtles/900 yards/1 day soak. An average of three trips per week is expected throughout the 14-week season, which translates to 42 trips during the study period. To come up with the anticipated level of takes for this study we applied the 2000 deep water sea turtle catch rate to the total number of planned trips. This provides an estimate of takes for the control gear but we also assumed that the additional 900 yards of low profile net would catch half as many sea turtles as the control net and the double lead line net would catch half as many as the low profile net. This provides an estimate of 12 sea turtle interactions, which is a species aggregate number that cannot be further divided among loggerhead, green, and Kemp's ridley sea turtles. The mortality of incidentally caught sea turtles in the deep water large mesh gillnet fishery during 2000 was 40%. When this percentage is applied to the interaction estimate for this study a total mortality of five sea turtles is expected. In the event that either of these thresholds are reached for species aggregate interactions or mortalities this study will be terminated.

## **COMPLIANCE**

NCDMF Marine Patrol officers will be responsible for enforcing permit and gear restrictions and monitoring fishing activities in the GNRAS. Enforcement costs for southeastern Pamlico Sound fisheries during the period 1998-1999 averaged \$5,000/year. This level of enforcement was sufficient to verify compliance with fisheries



regulations and management measures in place during that time period. Enforcement costs associated with the 2000 ITP greatly exceeded those of the fall fishery for previous years. Increased funding will be necessary for NCDMF Marine Patrol monitoring and enforcement of management measures in the GNRAs during the fall of 2001. If NCDMF funding for enforcement activities is not increased for 2001, it will be necessary to divert effort from other areas or programs to provide for enforcement of GNRA management measures.

## **REPORTING**

The NCDMF will provide the NMFS SERO, Protected Species Branch, and NMFS Headquarters, Endangered Species Division with monthly reports summarizing sea turtle takes (non-lethal and lethal) recorded in the observer program. These reports will include the total number of turtles taken, locations, and species. The NCDMF will also provide a summary of all takes over the sampling period. Data will be recorded on NCDMF standard observer data forms.

The NCDMF will provide NMFS with a report of actions implemented pursuant to the ITP within 120 days of the end of the Pamlico Sound fall gillnet fishery. The report will describe management measures taken to protect sea turtles and will include information from observer trips, gear interaction reports from fishermen, NCWRC stranding reports and NCDMF Marine Patrol reports of violations in the fall gillnet fisheries. The NCDMF report will also include an evaluation of the program's effectiveness in protecting threatened and endangered sea turtles and management recommendations for Pamlico Sound fall gillnet fisheries.

## **ANTICIPATED IMPACT**

The proposed activity has the potential to protect sea turtles by minimizing interactions with gillnets in southeastern Pamlico Sound during the fall of 2001. If gear interactions occur during fishing activities, observer data will help identify parameters of the responsible gear and distinguish time/area interaction patterns. The NCDMF believes that the proposed management measures will be effective in reducing sea turtle interactions with fishing gear. Reports from onboard observers, gear interactions, the NC Stranding Network, and the NCDMF Marine Patrol should allow sea turtle/gillnet interactions to be closely monitored and provide for the timely implementation of additional management measures or closures should thresholds for gear interaction or extrapolated mortality levels be exceeded.

## **ANTICIPATED IMPACT ON HABITAT**

The NCDMF believes that this proposed activity will have no impact on the habitat of sea turtles; therefore, no restoration of the affected habitat is proposed.

## **ALTERNATIVES CONSIDERED**

An alternative action considered, but rejected, by NCDMF was to not apply for an ITP in 2001 and to close the GNRAs to all gillnet fisheries during the fall. While this action would provide protection for sea turtles, it would not allow for collection of data that might assist in the identification of sources responsible for strandings of sea turtles in Pamlico Sound during the fall. The closure of the fall gillnet fishery for flounder, which was valued in excess of one million dollars in both 1998 and 1999, would have a severe economic impact on participating fishermen and the local economy.

## **APPLICATION**

The North Carolina Division of Marine Fisheries, PO Box 769, Morehead City, NC 28557, (Phone 252-726-7021) makes application for an Individual Incidental Take Permit under Section 10 of the Endangered Species Act authorizing implementation of management measures for protection of threatened and endangered sea turtles while allowing fall gillnet fisheries to be prosecuted in Pamlico Sound. It is requested that the ITP be valid from September 15 through December 15, 2001. An ITP may be requested by the NCDMF for the 2002 fishing season if it is determined that management measures are necessary and if the management measures implemented under the ITP in 2001 were effective in minimizing sea turtle mortalities in Pamlico Sound fall gillnet fisheries. The ITP will authorize the NCDMF to implement management measures in Pamlico Sound fall gillnet fisheries to protect sea turtles. It is estimated that approximately 125 vessels will participate in Pamlico Sound gillnet fisheries managed under the ITP in 2001.

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